MITSUBISHI

A1SJ71UC24-R4/A1SJ71C24-R4
Computer Link Module

MITSUBISHI

General-Purpose PROGRAMMABLE CONTROLLER

User's Manual
(Hardware)

Thank you for buying the Mitsubishi general-purpose programmable controller MELSEC-A Series.

Prior to use, please read this manual thoroughly and familiarize yourself with the product.

MELSEC

MODEL	A1SJ71C24-R4(H/W)-U-E
MODEL CODE	13JE52
IB(NA)-66491-E (1112) MEE	

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in the manual. Also pay careful attention to safety and handle the module properly.
These precautions apply only to Mitsubishi equipment. Refer to the CPU module user's manual used for a description of the programmable controller system safety precautions.
In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[DESIGN PRECAUTIONS]

⚠WARNING

- When performing the control of the programmable controller in operation (especially changing data, program and operation status (Remote RUN/STOP)) by connecting a personal computer, etc. to the special function module, configure an interlock circuit in a sequence program so the safety of the overall system is always maintained.
  Particularly in the above described control for a remote site programmable controller from an external device, troubles occurring on the programmable controller side may not be immediately handled due to a data communication error. Construct an interlock circuit in the sequence program and determine between the external device and programmable controller CPU the system's error handling procedure and other items regarding data communication errors.

⚠CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other.
  They should be installed 100 mm (3.9 inch) or more from each other.
  Not doing so could result in noise that would cause malfunction.

[INSTALLATION PRECAUTIONS]

⚠CAUTION

- Use the programmable controller in the environment given in the general specifications section of the applicable User's Manual for the CPU module used.
  Using this programmable controller in an environment outside the range of the general specifications could result in electric shock, fire, malfunction, and damage to or deterioration of the product.
- Shut off the external power supply for the system in all phases before wiring.
  If you do not switch off the external power supply, it will cause electric shock or damage to the product.
- Insert the tabs at the bottom of the module into the mounting holes in the base module, and tighten the module installation screws with the specified torque.
  If the module is not properly installed it may result in malfunction, failure or fallout.
- Tighten the screw within the range of specified torque.
  If the screw are loose, it may result in fallout, short circuit or malfunction.
  Tightening the screws too far may cause damage to the screw and /or the module, resulting in fallout, short circuit or malfunction.
- Do not directly touch the module's conductive parts or electronic components. Doing so could cause malfunction or failure in the module.
- Perform correct pressure-displacement, crimp-contact or soldering for wire connections using the tools specified by the manufactures.
  Attach connectors to the module securely.

[WIRING PRECAUTIONS]

⚠CAUTION

- Be sure that the communication cable connected to the module is kept in a duct or fixed with cramps.
  Failure to do so may cause a damage to the module or cables due to dangling, shifting or inadvertent handling of cables, or misoperation because of bad cable contacts.
- Before connecting the cables, check the type of interface to be connected.
  Connection, or erroneous wiring to the wrong interface may damage the module and external device.
- When connecting an external device to RS-422 interface of this module, do not connect a device that must receive power from this module.
  The module or external device may be damaged.
- Tighten the terminal screw within the range of specified torque.
  If the screws are loose it may result in short circuit or malfunction.
  Tightening the screws too far may cause damage to the screw and/or the module, resulting in fallout, short circuit or malfunction.
- Do not grab on the cable when removing the communication cable connected to the module.
  When removing the cable without connector, loose the screw on the side that is connected to the module.
  Pulling the cable that is still connected to the module may cause malfunction or damage to the module or cable due to bad cable contacts.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the unit.
  Such debris could cause fire, damage or malfunction.

[STARTING AND MAINTENANCE PRECAUTION]

⚠WARNING

- Do not touch the terminals while the power is on.
  Doing so may cause malfunction.
- Always switch OFF the external supply power used by the system in all phases before cleaning or retightening screws.
  If you do not switch off the external power supply, it will cause failure or malfunction of the module.
  If the screws are loose, it may result in fallout, short circuit or malfunction.
  Tightening the screws too far may cause damage to the screws and/ or the module, resulting in fallout, short circuit or malfunction.

⚠CAUTION

- Do not diassemble or modify the modules.
  Doing so could cause failure, malfunction, injury or fire.
- Shut off the external power supply for the system in all phases before mounting or removing the module.
  If you do not switch off the external power supply, it will cause failure or malfunction of the module.
- Before handling the module, touch a grounded metal object to discharge the static electricity from the human body.
  Not doing so may cause a failure or malfunction of the module.

[OPERATION PRECAUTIONS]

⚠WARNING
• Do not write data to the "system area" in the buffer memory of the special function module. Also, do not output (or turn on) a "use prohibited" signal from the programmable controller CPU to the special function module. If data is written to the "system area" or if the "use prohibited" signal is output, there is a risk that the programmable controller system will operate incorrectly.

⚠CAUTION
• Before performing the control of the programmable controller in operation(especially changing data, program and operation status(Remote RUN/STOP)) by connecting a personal computer, etc. to the special function module, read User's Manual (Com. link func. /Print. func.) carefully and confirm if the overall safety is maintained. Failure to perform correct operations to change data, program or the status may result in system malfunction, machine damage or an accident.

[DISPOSAL PRECAUTIONS]

⚠CAUTION
• When disposing the product, treat it as industrial waste.

●安全注意事项●

（使用之前请务必阅读）

在使用本产品之前，应仔细阅读本手册以及本手册中所介绍的相关手册，同时在充分注意安全的前提下正确操作。
在“安全注意事项”中，安全注意事项被分为“⚠警告”和“⚠注意”两个等级。

⚠警告	表示错误操作可能造成危险后果，导致死亡或重伤事故。
⚠注意	表示错误操作可能造成危险后果，导致中度伤害、轻伤或财产损失。

此外，根据情况不同，即使标注为“⚠注意”的事项也有可能会引发严重后果。
这两个等级的注意事项记载的均为重要内容，请务必遵守。
请妥善保管本手册以备需要时取阅，并将本手册交给最终用户。

【设计注意事项】

⚠警 告
（使用计算机链接功能时） ● 在特殊功能模块上连接计算机等以对运行中的可编程控制器进行控制（特别是数据更改、程序更改、运行状态的更改（远程 RUN/STOP））前，应在顺控程序上配置互锁电路，以保证整个系统始终能安全运行。 特别是在通过外部设备对远程的可编程控制器进行上述控制时，可能会因为数据通信异常而导致无法立即对可编程控制器侧的故障做出反应。 在顺控程序上配置互锁电路的同时，应在外部设备与可编程控制器 CPU 之间确定发生数据通信异常时的系统的处理方法。

【设计注意事项】

⚠警 告
（使用多点链接功能时） ● 数据链接出现通信异常时，通信异常站会变为以下状态。应使用通信状态信息，在顺控程序上配置互锁电路，以保证系统能安全运行。 否则可能由于误输出、误动作而导致事故发生。 (1) 主站、本地站保持通信异常前的数据。 (2) 远程站的所有输出将为 OFF。 ● 发生从站死机时，链接处理变为以下状态。 (1) 链接处理设置为“继续进行”（通过开关设置）时，仅死机的从站被解除连接，链接处理继续进行。 (2) 链接处理设置为“停止”（通过开关设置）时，一旦发生从站死机，全部站点将停止链接处理。 死机站点的确认方法请参照用户手册（多点链接功能篇）。 ● 如果主站对从站进行分离站的指定，被指定的从站将输出全点 OFF 数据，主站将把来自从站的传送数据看作全部 OFF。 应参照用户手册（多点链接功能篇），在充分理解分离站指定时的控制内容的基础上正确使用。 如果未正确使用，可能由于误输出、误动作而导致事故发生。

⚠注 意
● 请勿将控制线及通信电缆与主电路及动力线等捆扎在一起或相互靠得太近。 应相距大约 100mm 以上距离。 因为噪声有可能导致误动作。

【安装注意事项】

⚠注 意
● 应在所使用的CPU模块的用户手册记载的一般规格环境下使用可编程控制器。 如果在一般规格范围以外的环境中使用可编程控制器，可能导致触电、火灾、误动作、产品损坏或性能劣化。 ● 在安装、配线作业等时，必须将系统使用的外部供应电源全部断开后再进行操作。 如果未全部断开，有可能导致触电或产品损坏。 ● 请将模块下部的模块固定用凸起部切实插入基板的固定孔后，以规定的扭矩拧紧模块安装螺栓。 如果模块未正确安装并以螺栓固定，有可能造成误动作、故障或掉落。 ● 应在规定的扭矩范围内拧紧螺栓。 如果螺栓拧得过松，有可能导致掉落、短路或误动作。 如果螺栓拧得过紧，有可能造成螺栓及模块破损从而导致掉落、短路或误动作。 ● 请勿直接触碰模块的导电部分及电子部件。 否则可能导致模块误动作、故障。 ● 接口的配线连接应使用生产厂商指定的工具正确地进行压装、压接或焊接，接口应切实安装到模块上。

【配线注意事项】

⚠注 意

- 与模块相连接的通信电缆必须收入套管中，或者用夹具进行固定处理。
  如果未将电缆收入套管或未用夹具进行固定处理，可能由于电缆的晃动及移动、不经意的拉拽等造成模块及电缆破损、电缆接触不良而导致误动作。
- 电缆连接应在确认要连接的接口种类的基础上正确进行操作。如果连接了错误的接口或配线错误，可能导致模块、外部设备故障。
- 在本模块的 RS-422 接口上连接外部设备时，请勿连接需要从本模块供电的设备。
  如果连接，可能导致模块或外部设备故障。
- 应在规定的扭矩范围内拧紧端子螺栓。
  如果螺栓拧得过松，有可能导致短路或误动作。
  如果螺栓拧得过紧，有可能造成螺栓及模块破损从而导致掉落、短路或误动作。
- 在拆卸与模块相连接的通信电缆时，请勿用手拉扯电缆部分。
  不带接口的电缆应在松开与模块相连接部分的螺栓后再进行拆卸。
  如果在与模块相连接的状态下拉扯电缆，可能造成模块及电缆破损、电缆接触不良而导致误动作。
- 应注意防止切屑及配线头等异物掉入模块内。否则有可能导致火灾、故障或误动作。

【启动 / 维护注意事项】

⚠警 告

- 在通电状态下请勿触摸端子。否则可能导致误动作。
- 在清洁模块或重新紧固螺栓时，必须将系统使用的外部供应电源全部断开后再进行操作。如果未全部断开，有可能导致模块故障或误动作。如果螺栓拧得过松，有可能导致掉落、短路或误动作。
  如果螺栓拧得过紧，有可能造成螺栓及模块破损从而导致掉落、短路或误动作。

【启动／维护注意事项】

⚠注 意
● 请勿拆解或改造模块。 否则可能导致故障、误动作、人身伤害或火灾。 ● 在拆装模块时，必须将系统使用的外部供应电源全部断开后再进行操作。 如果未全部断开，有可能导致模块故障或误动作。 ● 在触碰模块之前，必须先触碰已接地的金属等，释放掉人体等所携带的静电。如果不释放掉静电，有可能导致模块故障或误动作。

【运行注意事项】

⚠警 告
● 请勿向特殊功能模块的缓冲存储器的“系统区”中写入数据。此外，在从可编程控制器 CPU 至特殊功能模块的输出信号中，请勿输出“禁止使用”的信号（或使之 ON）。如果对“系统区”进行数据写入，或对“禁止使用”的信号进行输出，有可能导致可编程控制器系统发生误动作。

⚠注 意
（使用计算机链接功能时） ● 在特殊功能模块上连接计算机等以对运行中的可编程控制器进行控制（特别是数据更改、程序更改、运行状态的更改（远程 RUN/STOP））前，应仔细阅读用户手册（计算机链接功能・打印机功能篇），在充分确认安全的基础上进行操作。 如果数据更改、程序更改、状态控制错误，有可能导致系统误动作、机械破损或事故发生。

【报废处理注意事项】

⚠注 意
● 本产品报废时，应当作工业废物处理。

● CONDITIONS OF USE FOR THE PRODUCT ●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT. ("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

About Manuals

The following product manuals are available.   Please use this table as a reference to request the appropriate manual as necessary.

Related Manuals

Manual Names	Manual No. (Model Code)
Computer Link Module Guide Book	SH-3510 (13JE76)
Computer Link Module (Com. link func. /Print. func.) User's Manual	SH-3511 (13JE77)

When using this module, be sure to read Computer Link Module User's Manual (Com. link func. /Print. func.) as well as this manual.

A1SJ71UC24-R4 computer link function is the same as AJ71UC24.

When you refer to the following manual to use A1SJ71UC24-R4, replace the module model name to refer.

- Computer Link Module User's Manual (Com. link func. /Print. func.) ....Version C or before

AJ71UC24 → A1SJ71UC24-R4

COMPLIANCE WITH EMC AND LOW VOLTAGE DIRECTIVES

(1) Method of ensuring compliance
To ensure that Mitsubishi programmable controllers maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to one of the following manuals.
• User's manual for the CPU module used
• User's manual (hardware) for the CPU module or base unit used
The CE mark on the side of the programmable controller indicates compliance with EMC and Low Voltage Directives.

(2) Additional measures
To ensure that this product maintains EMC and Low Voltage Directives, please refer to one of the manuals listed under (1).

MEMO

1. Overview

This manual is intended for installing the computer link module and performing wiring for external devices.

After unpacking the module, check that the following products are included:

Model name	Item name	Quantity
A1SJ71UC24-R4	A1SJ71UC24-R4 computer link module	1
	Terminal resistor for RS-422 communication 330 Ω 1/4 W (orange-orange-brown ⬚)	2
	Terminal resistor for RS-485 communication 110 Ω 1/2 W (brown-brown-brown ⬚)	2
A1SJ71C24-R4	A1SJ71C24-R4 computer link module	1
	Terminal resistor for RS-422 communication 330 Ω 1/4 W (orange-orange-brown ⬚)	2
	Terminal resistor for RS-485 communication 110 Ω 1/2 W (brown-brown-brown ⬚)	2

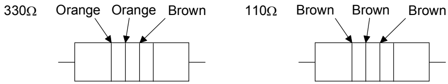
* In the explanation hereafter, the computer link/multi-drop link module is abbreviated as the "C24" except when differentiate specially.

* The following accesses to the programmable controller CPU with a dedicated protocol of the computer link function are possible by using A1SJ71UC24-R4.

  - Access to the device extended by AnACPU, AnUCPU and A2US(H)CPU.
  - Access to the other stations via MELSECNET/10.

  Other specifications are the same as A1SJ71C24-R4.

* Differentiate the terminal resistors as follows:



2. Transmission Specifications

The following table indicates the transmission specifications when using the C24 computer link function.
For general specifications of the UC24, see the user's manual for the CPU module used.

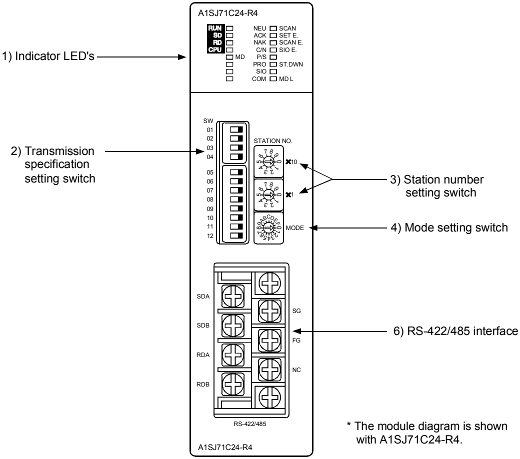
<table>
<tr><th colspan="2">Item</th><th colspan="3">Specification</th></tr>
<tr><td colspan="2">Interface</td><td colspan="3">Conform to RS-422/485</td></tr>
<tr><td colspan="2" rowspan="3">Transmission method</td><td>Dedicated protocol</td><td colspan="2">Half duplex communication method *1</td></tr>
<tr><td rowspan="2">No protocol/
Bidirectional</td><td>1 : 1
connection</td><td>Full duplex
communication method</td></tr>
<tr><td>1 : n, m : n
connection</td><td>Half duplex
communication method</td></tr>
<tr><td colspan="2">Synchronization system</td><td colspan="3">Start-stop synchronization method</td></tr>
<tr><td colspan="2">Transmission speed</td><td colspan="3">300, 600, 1200, 2400, 4800, 9600, 19200 bps
(Selected via the switch)</td></tr>
<tr><td rowspan="4">Data format</td><td>Start bit</td><td colspan="3">1</td></tr>
<tr><td>Data bit</td><td>7 or 8</td><td colspan="2" rowspan="3">Selected via the switch</td></tr>
<tr><td>Parity bit</td><td>1 or none</td></tr>
<tr><td>Stop bit</td><td>1 or 2</td></tr>
<tr><td colspan="2">Access cycle</td><td colspan="3">Processing for one request is performed during the END processing of the sequence program. Therefore, the access cycle is one scan time.</td></tr>
<tr><td colspan="2" rowspan="2">Error detection</td><td colspan="3">Parity check yes (odd/even) or no</td></tr>
<tr><td colspan="3">Sum check yes or no</td></tr>
<tr><td colspan="2">DTR/DSR control (ER/DR)</td><td colspan="3">No</td></tr>
<tr><td colspan="2">DC1/DC3, DC2/DC4 control</td><td colspan="3">Yes/No (selected by setting to the buffer memory)</td></tr>
<tr><td colspan="2" rowspan="3">Line configuration (external device: programmable controller CPU)</td><td>Dedicated protocol</td><td colspan="2">1 : 1, 1 : n, m : n</td></tr>
<tr><td>No protocol</td><td colspan="2">1 : 1, 1 : n</td></tr>
<tr><td>Bidirectional</td><td colspan="2">1 : 1</td></tr>
<tr><td colspan="2">Transmission distance</td><td colspan="3">RS-422/485 Overall distance 500m (1640 ft.) or less</td></tr>
<tr><td colspan="2">Current consumption</td><td colspan="3">5VDC 0.1A</td></tr>
<tr><td colspan="2">Occupied I/O points</td><td colspan="3">32 points *2</td></tr>
<tr><td colspan="2">Weight</td><td colspan="3">0.25 kg(0.56 lb.)</td></tr>
</table>

*1 When data communication can be performed using the full duplex transmission method, this transmission method is used whenever the on-demand function is used.

*2 When performing I/O assignment using the GPP function, set as special 32 points.
The model name to register when using the dedicated commands, the following model name should be set depending on C24 and programmable controller CPU mounted to C24.

Programmable controller CPU mounted to C24	Types of C24 to mount	
	A1SJ71UC24-R4	**A1SJ71C24-R4**
AnUCPU	A1SJ71UC24	AJ71C24S3
AnACPU	AJ71C24S3	
Other than AnU/AnACPU	(Model name setting is not necessary as the dedicated command cannot be used.)	

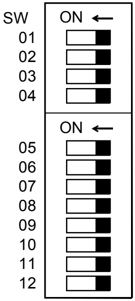
3. Name of Each Part and Setting



* The module diagram is shown with A1SJ71C24-R4.

Number	Name	Description	
1)	Indicator LEDs RUN □ NEU □ SCAN SD □ ACK □ SET E. RD □ NAK □ SCAN E. CPU □ C/N □ SIO E. □ MD P/S □ □ PRO □ ST.DWN □ SIO □ □ COM □ MD L	RUN	Normal operation indicator Normal : lit Error : unlit
		SD	Transmission status Data being transmitted : flashing
		RD	Reception status Data being received : flashing
		CPU	Communication Status with CPU main module. Communicating with programmable controller CPU : flashing
		MD	Multi-droplink Multi-droplink : lit Computer link : unit
		NEU	Neutral status Transmission sequence initial status (waiting for ENQ) : lit ENQ reception complete : unlit

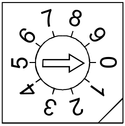
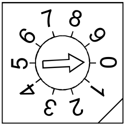
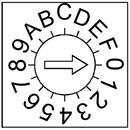
Number	Name	Description	
1)	Indicator LEDs (continued) RUN □ NEU □ SCAN SD □ ACK □ SET E. RD □ NAK □ SCAN E. CPU □ C/N □ SIO E. □ MD P/S □ □ PRO □ ST.DWN □ SIO □ □ COM □ MD L	ACK	ACK transmission status ACK transmitted : lit NAK transmitted : unlit
		NAK	NAK transmission status NAK transmitted : lit ACK transmitted : unlit
		C/N	Result of communication with programmable controller CPU Error in communication with the programmable controller CPU : lit Normal communication : unlit
		P/S	Parity/sum check error Parity/sum check error : lit Normal : unlit
		PRO	Protocol error Normal protocol error : lit Normal : unlit
		SIO	SIO error When overrun or framing error : lit When received data has been discarded due to OS receive area full : lit Normal : unlit
		COM	Computer link Computer link or multi-drop link (local station) : lit Multi-drop link (master station) : unlit

Number	Name	Description			
2)	Transmission setting switch	Transmission settings (all are set to OFF at the time of shipment)			
		**SW**	**Setting item**	**Status**	
				ON	**OFF**
		01	Not used	—	—
		02	Computer link/multi-drop link selection	Computer link	Setting impossible
		03	A1ADP-SP setting *1	A1ADP-SP used	A1ADP-SP not used
		04	Setting for write during RUN	Enabled	Disabled
		05	Transmission speed setting	See *2	
		06			
		07			
		08	Data bit setting	8 bits	7 bits
		09	Parity bit setting	YES	NO
		10	Even/odd parity setting	Even	Odd
		11	Stop bit setting	2 bits	1 bit
		12	Sum check setting	YES	NO

*1 This setting is available when software version of the A1SJ71UC24-R4 is X or later, and not available for the A1SJ71C24-R4.

*2 Transmission speed settings

	Transmission speed (unit: bps)							
Setting switch	**300**	**600**	**1200**	**2400**	**4800**	**9600**	**19200**	**Setting prohibited**
SW05	OFF	ON	OFF	ON	OFF	ON	OFF	ON
SW06	OFF	OFF	ON	ON	OFF	OFF	ON	ON
SW07	OFF	OFF	OFF	OFF	ON	ON	ON	ON

<table>
<tr><th>Number</th><th>Name</th><th colspan="2">Description</th></tr>
<tr><td>3)</td><td>Station number setting switch
 ×10
 ×1</td><td colspan="2">Module station number setting (set to 00 at time of shipment)
<Setting range>
00 to 31
X10 --- set the station number ten's place
X1 --- set the station number unit's place</td></tr>
<tr><td rowspan="10">4)</td><td rowspan="10">Mode setting switch
 MODE</td><td colspan="2">Mode setting (set to 0 at the time of shipment)</td></tr>
<tr><td>Mode</td><td>Setting contents</td></tr>
<tr><td>0</td><td>Use prohibited</td></tr>
<tr><td>1
to
3</td><td>Use prohibited</td></tr>
<tr><td>4</td><td>Non procedure mode</td></tr>
<tr><td>5</td><td>Type 1 dedicated protocol mode</td></tr>
<tr><td>6</td><td>Type 2 dedicated protocol mode</td></tr>
<tr><td>7</td><td>Type 3 dedicated protocol mode</td></tr>
<tr><td>8</td><td>Type 4 dedicated protocol mode</td></tr>
<tr><td>9
to
E</td><td>Use prohibited</td></tr>
<tr><td></td><td></td><td>F</td><td>For module test</td></tr>
<tr><td>5)</td><td>RS-422/485 interface</td><td colspan="2">RS-422/485 interface for external device connection</td></tr>
</table>

4. Loading and Installation

This section explains precautionary items regarding handling of the C24 from unpacking up to installation, and the installation environment that are common to all modules.

See the user's manual for the programmable controller CPU module used for further details regarding module loading and installation.

4.1 Precautionary Items when Handling

The following explains precautionary items when handling the module:

(1) Do not drop or apply severe shock to the module case since it is made of resin.

(2) Tighten the module installation screws within the specified torque range as follows:

Screw Area	Tightening Torque Range
RS-422 / 485 terminal block terminal screws (M3.5 screw)	59 to 88N • cm (5.2 to 7.8lb • inch)
Module installation screws (M4 screw)	78 to 118N • cm (6.9 to 10.4lb • inch)
RS-422 / 485 terminal block installation screws (M3.5 screw)	49 to 78N • cm (4.3 to 6.9lb • inch)

4.2 Installation Environment

Avoid the following conditions for the installing location of the AnS Series programmable controller:

(1) Location where the ambient temperature exceeds the range of 0 to 55 °C.

(2) Location where the ambient humidity exceeds the range of 10 to 90% RH.

(3) Location where condensation occurs due to a sudden temperature change.

(4) Location where corrosive or inflammable gas exists.

(5) Location where a lot of conductive powdery substance such as dust and iron filing, oil mist, salt, or organic solvent exists.

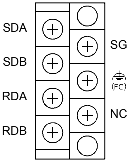
(6) Location exposed to direct sunlight.

(7) Location where strong electric fields or magnetic fields form.

(8) Location where vibration or impact is directly applied to the main module.

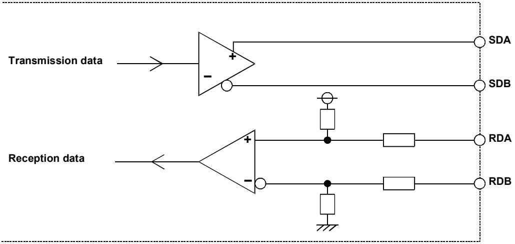
5. External Wiring

The standard method for connecting the RS-422/485 line is shown below:



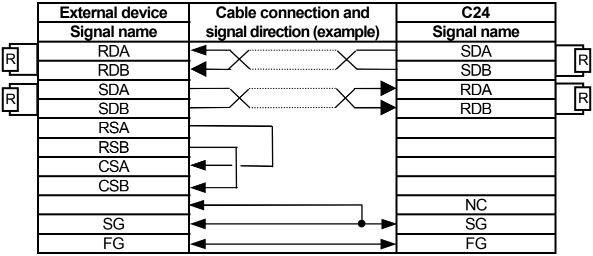
Signal abbreviation	Signal direction C24 ←→ External device	Description
SDA	→	Transmission data
SDB	→	Transmission data
RDA	←	Reception data
RDB	←	Reception data
SG	←→	Signal ground
FG	←→	Frame ground
NC	—	Vacancy

(Function block diagram for the C24)



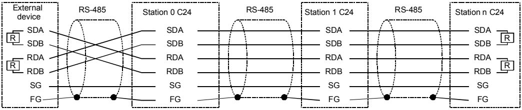
Point
If the C24 serves as the first or the last station on the RS-422/485 line, connect a terminal resistor as shown below to the RS-422/485 interface according to the communication specification. When a terminal resistor is not connected, an error may result during data communication. • For RS-422 communication .... 330 Ω, 1/4W • For RS-485 communication .... 110 Ω, 1/2W (1) When an external device and the C24 are connected in 1:1 or 1:n, connect a terminal resistor between SDA and SDB as well as between RDA and RDB. (2) When an external device and C24 are connected in m:n, connect a terminal resistor between RDA and RDB. The R in the following wiring diagram represents a terminal resistor.

(1) Example of connecting external devices and C24 by 1:1



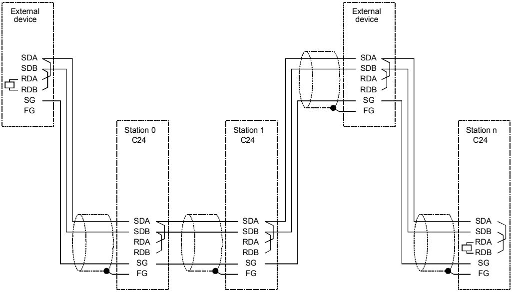
(2) Example of connecting external devices and C24 by 1:n

* Connecting external devices and C24 modules via RS-485



(3) Example of connecting external devices and C24 by m:n

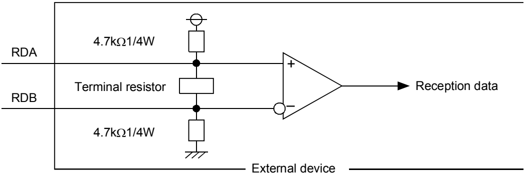
* Connecting external devices and C24 modules via RS-485



(4) Countermeasure for data reception errors in the external device with the RS-422 or RS-422/485 connection

During data communication with external devices via C24 RS-422/485 interface , if there is a possibility that the external device receives an error data, install pull-up and pull-down resistors to the external device side (about 4.7kΩ, 1/4 W as a reference of resistor value).

Installation of pull-up and pull-down resistors will prevent data reception errors.



Point

Installation of pull-up and pull-down resistors will prevent data reception errors.

Remarks

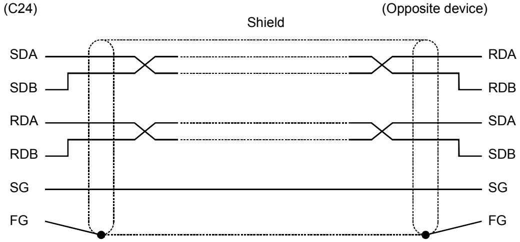
The following explains the case in which pull-up and pull-down resistors are not installed to the external device:

1) When none of the stations are receiving, the transmission line is in a state of high impedance, causing the transmission line to become unstable due to noise and a possibility that the data will be received incorrectly at the external device.
   When this happens, a parity error or framing error is likely to occur. Therefore, skip the data when the error has occurred.
2) For data communication using the dedicated protocol, the first data will be determined based on the format used by the user. Skip the data received prior to the first data as determined.

(5) Precautionary items when wiring

1) When connecting the SG and FG signals of the C24 to an external device, follow the specification of the external device.

2) If data communication cannot be performed normally due to external noise even if the wiring is done according to this section, perform wiring as follows:
(Connect nnA and nnB in each signal of the connector cable as a pair.)

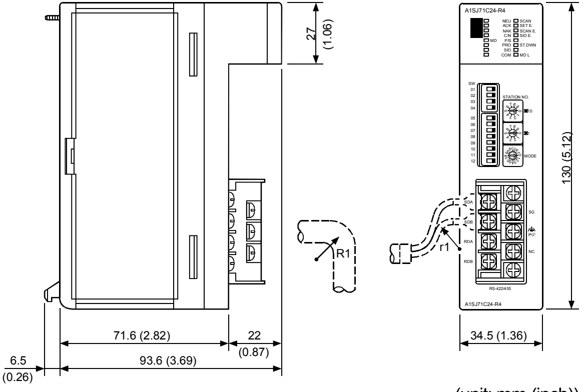


* When data communication cannot be performed normally even if this wiring is done, connect the connector cable shield to either one of the FG terminals on the connected device. (when connect to the external device, refer to the handling manual of the external device.)

Point

(1) In the explanation of the terminal resistor setting/connection in this section, when an RS-232C - RS-422 converter or other equipment is used for the device which serves as either of the line terminating stations, setting and wiring for a terminal resistor is required on the converter (or the equipment).
(2) The devices connected to the C24's RS-422/RS485 interface must use all RS-422 or all RS-485, including 1:n and m:n connections.

6. External Dimensions



(unit: mm (inch))

R1 (Bending radius near terminal block) : Cable diameter × 4
r1 (Bending radius near crimp contact) : Can be connected in a range without extreme bend

External dimensions of A1S71UC24-R4 and A1SJ71C24-R4 are the same. The diagram above is of A1SJ71UC24-R4 external dimensions.

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